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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/511,622	10/18/2004	Masayuki Orihashi	MAT-8605US	4055

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EXAMINER	
BRANDT, CHRISTOPHER M	

ART UNIT	PAPER NUMBER
2617	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/511,622	ORIHASHI ET AL.	
	Examiner	Art Unit	
	Christopher M. Brandt	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 October 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 October 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 USC 119(a)-(d), which papers have bee placed of record in the application file.

Information Disclosure Statement

The information disclosure statement submitted on October 18, 2004 have been considered by the examiner and made of record in the application file.

Drawings

Figure 44 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-34 are rejected under 35 USC 103(a) as being unpatentable over **Fullerton et al. (US Patent 5,677,927, hereinafter FullertonA)** in view of **Fullerton (US Patent US Patent 5,687,169, hereinafter FullertonB)**.

Consider **claim 1 (and similarly applied to claim 32)**. FullertonA discloses a communication apparatus comprising: a transmission modulator for impulse-modulating transmission data and generating subcarriers; a carrier control section for controlling the subcarriers for use in communication; and an antenna section for radiating the subcarrier signals

(figure 17, column 18 lines 16-61, read as an impulse radio transmitter having three subcarrier generator/modulators (SC GEN/MOD) 1702, 1704 and 1706, each having a different subcarrier frequency. In addition, three modulated subcarrier signals are output by the three subcarrier generators/modulators 1702, 1704 and 1706, via lines 1728, 1730 and 1732, and are summed at a summer 1714. A resultant signal 1716 is sent to the subcarrier time modulator 1016, where it is used to modulate the coded timing signal 1014 to generate modulated, coded timing signal. FullertonA also discloses that impulse radio performance has been measured for a 1.3 GHz/2 mpps prototype (with an average output power of 33 .mu.W) over two paths).

FullertonA substantially discloses the claimed invention but fail to explicitly teach that the communication is depending upon information amount, significance and communication propagation condition.

However, FullertonB discloses that the communication is depending upon information amount, significance and communication propagation condition (column 9 lines 45-65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the teachings of FullertonB into the invention of FullertonA in order to provide two-way transmittal of information (column 9 lines 56-65).

Consider **claim 2 and as applied to claim 1**. FullertonA and FullertonB disclose a reception modulator for detecting reception data and examining a reception power on each subcarrier, to notify to the subcarrier control section a permission/non-permission to use the subcarrier, depending upon the reception power examined by the reception demodulator (FullertonA; column 28 lines 17-30).

Consider **claim 3 and as applied to claim 2**. FullertonA and FullertonB disclose wherein the carrier control section causes hopping two or more of the subcarriers (FullertonA; column 18 lines 52-61, column 21 lines 49-61).

Consider **claim 4 and as applied to claim 2**. FullertonA and FullertonB disclose wherein the carrier control section causes spread on two or more of the subcarriers (FullertonA; column 18 lines 52-61, column 21 lines 49-61).

Consider **claim 5 and as applied to claim 2**. FullertonA and FullertonB disclose wherein the transmission modulator changes an on-frequency allocation of the subcarriers according to communication condition (FullertonB; column 2 lines 33-39).

Consider **claim 6 and as applied to claim 2**. FullertonA and FullertonB disclose wherein the transmission modulator assigns a narrower band to the subcarrier having a lower center frequency and a broader band to the subcarrier having a higher center frequency (FullertonA; column 8 lines 31-40).

Consider **claim 7 and as applied to claim 2**. FullertonA and FullertonB disclose a channel control section for selecting and controlling the subcarrier for use on each channel, the channel control section performing communication over two or more channels with different ones of the subcarriers (FullertonA; column 19 lines 16-61).

Consider **claim 8 and as applied to claim 7**. FullertonA and FullertonB disclose wherein the channel control section performs communication over two or more channels with a combination of different ones of the subcarriers (FullertonA; column 19 lines 16-61).

Consider **claim 9 and as applied to claim 7**. FullertonA and FullertonB disclose wherein carrier control section performs communication of control information by at least one of the subcarriers (FullertonA; column 2 lines 11-29).

Consider **claim 10 and as applied to claim 9**. FullertonA and FullertonB disclose wherein the transmission modulator multiplexes together the pieces of control information on two or more channels by use of any one of time division multiplexing and code division multiplexing, in at least one subcarrier of two or more of the subcarriers (FullertonA; column 19 lines 16-61, FullertonB; column 11 lines 43-55, column 13 lines 40-47).

Consider **claim 11 and as applied to claim 2**. FullertonA and FullertonB disclose wherein the transmission modulator carries out frequency division duplex by use of two or more of the subcarriers (FullertonB, column 12 lines 35-65).

Consider **claim 12 and as applied to claim 9**. FullertonA and FullertonB disclose wherein the transmission modulator carries out frequency division duplex by use of three or more of the subcarriers (FullertonB, column 12 lines 35-65).

Consider **claim 13 and as applied to claim 9**. FullertonA and FullertonB disclose wherein the subcarrier with which the transmission modulator is to communicate the control information has a center frequency lower than a center frequency of the other subcarrier (FullertonA; column 7 lines 1-9).

Consider **claim 14 and as applied to claim 9**. FullertonA and FullertonB disclose wherein the subcarrier with which the transmission modulator is to communicate the control information has a band narrower than a band of the other subcarrier (column 10 lines 43-56).

Consider **claim 15 and as applied to claim 7**. FullertonA and FullertonB disclose wherein the transmission modulator divides one symbol into two or more of the subcarriers, thereby multiplexing two or more channels (FullertonA; column 18 lines 45-61).

Consider **claim 16 and as applied to claim 15**. FullertonA and FullertonB disclose wherein the transmission modulator causes frequency hopping in one symbol by use of two or more of the subcarriers, to thereby multiplexing two or more channels (FullertonA; column 18 lines 45-61).

Consider **claim 17 and as applied to claim 15**. FullertonA and FullertonB disclose wherein the transmission modulator causes encoding spread of one symbol onto two or more of the subcarriers, to thereby multiplexing two or more channels (FullertonA; column 18 lines 45-61).

Consider **claim 18 and as applied to claim 15**. FullertonA and FullertonB disclose wherein the transmission modulator causes spread of one symbol onto two or more of the subcarriers and two or more chips, thereby multiplexing two or more channels (FullertonA; column 22 lines 55-67).

Consider **claim 19 and as applied to claim 2**. FullertonA and FullertonB disclose wherein the antenna section comprises a plurality of antenna elements (FullertonA; column 13 lines 3-8).

Consider **claim 20 and as applied to claim 2**. FullertonA and FullertonB disclose wherein the antenna section has a frequency characteristic of a multi-band characteristic (FullertonA; column 13 lines 3-10, column 14 lines 7-23).

Consider **claim 21 and as applied to claim 19**. FullertonA and FullertonB disclose wherein the antenna elements are different in center frequency of frequency characteristic (FullertonA; column 13 lines 3-10, column 14 lines 7-23).

Consider **claim 22 and as applied to claim 21**. FullertonA and FullertonB disclose wherein the antenna elements have band characteristics not to overlap on a frequency axis (FullertonA; column 27 line 66 – column 28 line 17).

Consider **claim 23 and as applied to claim 2**. FullertonA and FullertonB disclose wherein the antenna section receives radio wave on a subcarrier-by-subcarrier basis and outputs the subcarrier signal to the reception modulator (FullertonA; column 19 lines 16-61).

Consider **claim 24 and as applied to claim 19**. FullertonA and FullertonB disclose wherein the antenna elements have frequency characteristics corresponding to the subcarriers and radiate subcarrier transmission signal as a radio wave (FullertonA; column 27 line 66 – column 28 line 17).

Consider **claim 25 and as applied to claim 2**. FullertonA and FullertonB disclose wherein the reception demodulator has a compensation section for detecting a characteristic of a signal sequence of each subcarrier from a known signal received from a communication partner and compensating for the characteristic (FullertonA; column 19 lines 16-61).

Consider **claim 26 and as applied to claim 25**. FullertonA and FullertonB disclose wherein the characteristic is a frequency characteristic (FullertonA; column 3 lines 61-67).

Consider **claim 27 and as applied to claim 25**. FullertonA and FullertonB disclose wherein the characteristic is a time response characteristic, the compensation section compensating for the time response characteristic by a correlation signal of a correlator (FullertonA; column 20 lines 52-65).

Consider **claim 28 and as applied to claim 2**. FullertonA and FullertonB disclose wherein the reception demodulator comprises a spread code storing section for storing a spread code and extracting a spread code corresponding to the subcarrier, and a dispread section for making a convolution operation of the subcarrier signal and the spread code extracted at the spread code storing section (FullertonA; column 19 lines 1-10).

Consider **claim 29 and as applied to claim 2**. FullertonA and FullertonB disclose wherein the transmission demodulator comprises a spread code storing section for storing a spread code and extracting a spread code corresponding to the subcarrier, and a spread section for making a direct spread onto the subcarrier from the modulation signal divided into the subcarriers and the spread code extracted at the spread code storing section (FullertonA; column 19 lines 11-31).

Consider **claim 30 and as applied to claim 2**. FullertonA and FullertonB disclose wherein the reception demodulator comprises a switch section for switching over by frequency hopping on the subcarrier, the carrier control section carrying out the control in the switch section (FullertonA; column 23 lines 1-19).

Consider **claim 31 and as applied to claim 2**. FullertonA and FullertonB disclose wherein the transmission demodulator comprises a switch section for switching over by frequency hopping on the subcarrier, the carrier control section carrying out the control in the switch section (FullertonA; column 23 lines 1-19).

Consider **claim 33 and as applied to claim 32**. FullertonA and FullertonB disclose wherein the determination is to use, in a later communication, the subcarrier having the reception power equal to or smaller than a predetermined value (FullertonA; column 28 lines 17-39).

Consider **claim 34 and as applied to claim 33**. FullertonA and FullertonB disclose further comprising a step of measuring a reception power on every subcarrier of a received known signal at a start of communication; and a step of selecting the subcarrier having the measured reception power equal to or greater than a predetermined value, as a subcarrier usable in communication (FullertonA; column 28 lines 17-39).

Conclusion

Any response to this Office Action should be **faxed to** (571) 273-8300 **or mailed to:**

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Hand-delivered responses should be brought to

Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Brandt whose telephone number is (571) 270-1098. The examiner can normally be reached on 7:30a.m. to 5p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nick Corsaro can be reached on (571) 272-7876. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

Christopher M. Brandt

C.M.B./cmb

January 22, 2008

WILLIAM TROST
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600